Message

From: Whittier, Robert [Robert.Whittier@doh.hawaii.gov]
Sent: 5/15/2021 2:55:27 AM
To: douglas.roff@aecom.com; Kronen, John [john.kronen@aecom.com]; Linder, Steven [Linder.Steven@epa.gov]; Matt Tonkin [matt@sspa.com]; Tu, Lyndsey [Tu.Lyndsey@epa.gov]; Grange, Gabrielle Fenix [gabrielle.grange@doh.hawaii.gov]; Shende, Anay [anay.shende@doh.hawaii.gov]; Don Thomas [dthomas@soest.hawaii.edu]; Casey, Patrick N [patrick.n.casey@hawaii.gov]; Chenet, Robert F [Robert.F.Chenet@hawaii.gov]; Hardy, Roy [roy.hardy@hawaii.gov]; Imata, Ryan R [ryan.r.imata@hawaii.gov]; Fujimoto, Dayna K CIV USN NAVFAC HAWAII PEARL (USA) [dayna.fujimoto@navy.mil]; susan.lohr@navy.mil
CC: Chuang, Yueh [yueh.chuang@aecom.com]; Pauli, Skyler [skyler.pauli@aecom.com]; Johnson, Jeff [JEFF.JOHNSON@aecom.com]; Curtis C. Stanley (ccstanley@gsi-net.com) [ccstanley@gsi-net.com]; Ellis, Caitlin [caitlin.ellis@aecom.com]; Callan, Elijah [elijah.callan@aecom.com]; Ferguson, Colin [Colin.Ferguson@aecom.com]; Mintz, Bianca [Bianca.Mintz@aecom.com]; Mariano, Dominic [dominic.mariano@aecom.com]; Bonny, Estelle [Estelle.Bonny@aecom.com]
Subject: Re: RHMW12A Drilling Status

Thanks Doug,

Let me know when you want to discuss transferring the isotope samples. Works best for me to meet your folks at the beginning of the work day. I live pretty close to Red Hill and am up early so can get together as they arrive at the site. Also, since you folks aren't sampling the original RHMW12, would like to discuss DOH getting a grab sample. We can discuss the chemistry anomalies we saw in the sample you folks collected a couple of years ago. I think with a little more investigation we can shed some light on the source of elevated TDS.

Thanks,
Bob W.

From: Roff, Douglas <Douglas.Roff@aecom.com>
Sent: Friday, May 14, 2021 4:35 PM
To: Kronen, John <john.kronen@aecom.com>; Linder, Steven <linder.steven@epa.gov>; Matt Tonkin <matt@sspa.com>; TU, LYNDSEY <Tu.Lyndsey@epa.gov>; Grange, Gabrielle Fenix <Gabrielle.Grange@doh.hawaii.gov>; Whittier, Robert <Robert.Whittier@doh.hawaii.gov>; Shende, Anay <anay.shende@doh.hawaii.gov>; Don Thomas <dthomas@soest.hawaii.edu>; Casey, Patrick N <patrick.n.casey@hawaii.gov>; Chenet, Robert F <Robert.F.Chenet@hawaii.gov>; Hardy, Roy <roy.hardy@hawaii.gov>; Imata, Ryan R <ryan.r.imata@hawaii.gov>; Fujimoto, Dayna K CIV USN NAVFAC HAWAII PEARL (USA) <dayna.fujimoto@navy.mil>; Lohr, Susan C CIV USN NAVSHIPYDIMF PEARL (USA) <susan.lohr@navy.mil>
Cc: Chuang, Yueh <yueh.chuang@aecom.com>; Pauli, Skyler <skyler.pauli@aecom.com>; Johnson, Jeff <JEFF.JOHNSON@aecom.com>; Curtis C. Stanley (ccstanley@gsi-net.com) <ccstanley@gsi-net.com>; Ellis, Caitlin <caitlin.ellis@aecom.com>; Callan, Elijah <elijah.callan@aecom.com>; Ferguson, Colin <Colin.Ferguson@aecom.com>; Mintz, Bianca <Bianca.Mintz@aecom.com>; Mariano, Dominic <dominic.mariano@aecom.com>; Bonny, Estelle <Estelle.Bonny@aecom.com>
Subject: [EXTERNAL] RE: RHMW12A Drilling Status

All,

Attached is the next installment of near real-time data for consideration by the regulatory agencies and external stakeholders (DLNR-CWRM) during drilling activities at Red Hill drilling location RHMW12A.

Following retrieval of the Aquatroll multi-parameter sonde on 5/13/21 Valley Well Drilling (VWD) bailed approximately 21 gallons from the RHMW12A borehole (which was at a temporary depth of approximately 215 below ground surface.

The land surface elevation (LSE) is approximately 238 feet above mean sea level (msl) so the bottom of the boring was roughly 23 feet above msl. The depth to water (DTW) after bailing was measured initially with a water level probe and later the sonde. DTW at the time of sonde deployment was 183.21 feet below top of casing (btoc). The top of casing was approximately 3 feet above the LSE. The resulting water level elevation (WLE) was: (LSE + Stickup - DTW) = 238 + 3 – 183.21= ~58 feet above msl. The sonde was retrieved 2-1/2 jours later. DTW at the time of sonde retrieval was 179.89 feet btoc. The resulting WLE was: (LSE + Stickup - DTW) = 238 + 3 – 179.89= ~61 feet above msl. The sonde was downloaded and the file is attached.

Then, following a request from DOH, we collected samples for inorganics analysis and also to provide a sample to DOH for stable isotope analysis.

After sampling, Valley Well Drilling, tripped out casing.

Today VWD removed the Mobile B-59 drill rig from the site, and brought the T3 air-rotary rig onsite. No testing or drilling was performed today. Reaming is likely to start some time on Monday. I don't expect they'll start reaming until later in the day.

We will continue to provide periodic updates as we progress with RHMW12A.

Mahalo,

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From: Roff, Douglas
Sent: Thursday, May 13, 2021 10:03 PM
To: Kronen, John <john.kronen@aecom.com>; 'Linder, Steven (Linder.Steven@epa.gov)' <Linder.Steven@epa.gov>; Matt Tonkin <matt@sspa.com>; 'Tu, Lyndsey' <Tu.Lyndsey@epa.gov>; Grange, Gabrielle Fenix <Gabrielle.Grange@doh.hawaii.gov>; Whittier, Robert <Robert.Whittier@doh.hawaii.gov>; anay.shende@doh.hawaii.gov; Don Thomas <dthomas@soest.hawaii.edu>; Casey, Patrick N <patrick.n.casey@hawaii.gov>; Chenet, Robert F <Robert.F.Chenet@hawaii.gov>; Hardy, Roy (roy.hardy@hawaii.gov) <roy.hardy@hawaii.gov>; Imata, Ryan R (ryan.r.imata@hawaii.gov) <ryan.r.imata@hawaii.gov>; Fujimoto, Dayna K CIV USN NAVFAC HAWAII PEARL (USA) <dayna.fujimoto@navy.mil>; Lohr, Susan C CIV USN NAVSHIPYDIMF PEARL (USA) <susan.lohr@navy.mil>
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Subject: RE: RHMW12A Drilling Status

All,

Attached is the next installment of near real-time data for consideration by the regulatory agencies and external stakeholders (DLNR-CWRM) during drilling activities at Red Hill drilling location RHMW12A.

On 5/12/21 Valley Well Drilling continued coring to a depth of approximately 215 below ground surface. The land surface elevation (LSE) is approximately 238 feet above mean sea level (msl) so the bottom of the boring was roughly 23 feet above msl. The specific conductance of the drilling make-up water was approximately 0.56 mS/cm read from the In-Situ SmartTroll water quality meter.

The HQ core casing was then withdrawn 10 feet off the bottom. We deployed the Aquatroll multi-parameter sonde overnight to record water quality and water level data. The depth to water (DTW) at the time of sonde deployment was 120.06 feet below top of casing (btoc). The top of casing was approximately 3 feet above the LSE. The resulting approximate water level elevation (WLE) was: (LSE + Stickup - DTW) = 238 + 3 – 120.06= ~121 feet above msl. This morning we recovered the sonde. The DTW at the time of sonde recovery was 148.66 feet btoc. The resulting approximate WLE was: 238 + 3 – 148.66 = ~92 feet above msl. For reference the water elevation in the nearby RHMW12 was about 53 feet above msl in January of this year as reported by the USGS.

Following transducer recovery, we performed a bail-down slug test. Then, following a request from DOH, we collected samples for inorganic analysis and also to provide a sample to DOH for stable isotope analysis.

After sampling, Valley Well Drilling, tripped out casing. Tomorrow they will bring on the air-rotary rig to begin preparations for reaming to set the intermediate (10-inch) casing. This will be done to isolate the variably saturated zone water before coring below the piezometric head of the basal aquifer (assumed to be ca. 18 feet above msl).

Attached is the transducer file from overnight monitoring. Tomorrow we will send the file from today's slug test.

We will continue to provide periodic updates as we progress with RHMW12A.

Mahalo,
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From: Kronen, John <john.kronen@aecom.com>
Sent: Wednesday, May 12, 2021 7:19 PM
To: 'Linder, Steven (Linder.Steven@epa.gov)' <Linder.Steven@epa.gov>; Matt Tonkin <matt@sspa.com>; 'Tu, Lyndsey' <Tu.Lyndsey@epa.gov>; Grange, Gabrielle Fenix <Gabrielle.Grange@doh.hawaii.gov>; Whittier, Robert <Robert.Whittier@doh.hawaii.gov>; anay.shende@doh.hawaii.gov; Don Thomas <dthomas@soest.hawaii.edu>; Casey, Patrick N <patrick.n.casey@hawaii.gov>; Chenet, Robert F <Robert.F.Chenet@hawaii.gov>; Hardy, Roy (roy.hardy@hawaii.gov) <roy.hardy@hawaii.gov>; Imata, Ryan R (ryan.r.imata@hawaii.gov) <ryan.r.imata@hawaii.gov>; Fujimoto, Dayna K CIV USN NAVFAC HAWAII PEARL (USA) <dayna.fujimoto@navy.mil>; Lohr, Susan C CIV USN NAVSHIPYDIMF PEARL (USA) <susan.lohr@navy.mil>
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Subject: RHMW12A Drilling Status

All,

Attached is the next installment of near real-time data for consideration by the regulatory agencies as well as external stakeholders (DLNR-CWRM) during drilling activities at Red Hill drilling location RHMW12A. Drilling and well installation efforts resumed on 5/11 at a drilled depth of 195 feet below ground surface (bgs). After mobilizing the drill rig over the borehole, the driller pulled the HQ core casing 12 feet off bottom prior to data collection efforts. We conducted a baildown slug test in the afternoon at drilled depth 195 feet bgs. We deployed the Aquatroll sonde to evaluate water quality and water levels. The depth to water at RHMW12A at the time of Aquatroll deployment was 182 feet below top of casing (btoc). The top of casing is approximately 5 feet above land surface elevation (LSE), which is approximately 238 feet above mean sea level (msl). The resulting approximate water level elevation (WLE) (for synchronization with the transducer pressure measurements) was: (LSE+Stickup-DTW) = 238+5-182=~61 feet msl. Note that these estimates are roughly +/- 1 foot. As you can see from the pressure profile, the WLE relatively steadily rose over the period of data collection of 80 minutes (note that the last few readings represent the period of sonde retrieval).

Based on these results, we decided to deploy the Aquatroll sonde overnight to continue evaluating water quality and water levels. The depth to water at RHMW12A at the time of Aquatroll deployment was 163 feet btoc. The top of casing is approximately 5 feet above LSE, which is approximately 238 feet msl. The resulting approximate WLE (for synchronization with the transducer pressure measurements) was: (LSE+Stickup-DTW) = 238+5-163=~80 feet msl. Note that these estimates are approximate. The depth to water at RHMW12A at the completion of Aquatroll data collection this morning was 143 feet btoc (LSE+Stickup-DTW) = 238+5-143=~100 feet msl. As you can see from the overnight pressure profile, the WLE rose over time approximately 20 feet overnight (~16 hours) and approached an asymptote at approximately 100' msl. The specific conductance of the drilling make-up water was approximately 0.56 mS/cm read from the In-Situ SmartTroll water quality meter.

We will continue to provide periodic updates as we progress forward at RHMW12A.

Thanks,
Jack

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From: Kronen, John
Sent: Wednesday, April 28, 2021 10:33 AM
To: 'Linder, Steven (Linder.Steven@epa.gov)' <Linder.Steven@epa.gov>; 'Matt Tonkin' <matt@sspa.com>; 'Tu, Lyndsey' <Tu.Lyndsey@epa.gov>; 'Grange, Gabrielle Fenix' <Gabrielle.Grange@doh.hawaii.gov>; 'Whittier, Robert' <Robert.Whittier@doh.hawaii.gov>; 'anay.shende@doh.hawaii.gov' <anay.shende@doh.hawaii.gov>; Don Thomas <dthomas@soest.hawaii.edu>; Casey, Patrick N <patrick.n.casey@hawaii.gov>; 'Chenet, Robert F'

<Robert.F.Chenet@hawaii.gov>; Hardy, Roy (roy.hardy@hawaii.gov) <roy.hardy@hawaii.gov>; Imata, Ryan R (ryan.r.imata@hawaii.gov) <ryan.r.imata@hawaii.gov>; Fujimoto, Dayna K CIV USN NAVFAC HAWAII PEARL (USA) <dayna.fujimoto@navy.mil>; Lohr, Susan C CIV USN NAVSHIPYDIMF PEARL (USA) <susan.lohr@navy.mil>
Cc: Yueh Chuang (yueh.chuang@aecom.com) <yueh.chuang@aecom.com>; Skyler Pauli (skyler.pauli@aecom.com) <skyler.pauli@aecom.com>; Johnson, Jeff <JEFF.JOHNSON@aecom.com>; Roff, Douglas <Douglas.Roff@aecom.com>; Curtis C. Stanley (ccstanley@gsi-net.com) <ccstanley@gsi-net.com>; Caitlin Ellis (caitlin.ellis@aecom.com) <caitlin.ellis@aecom.com>; Elijah Callan (elijah.callan@aecom.com) <elijah.callan@aecom.com>; Ferguson, Colin <Colin.Ferguson@aecom.com>; Mintz, Bianca <Bianca.Mintz@aecom.com>; Mariano, Dominic <dominic.mariano@aecom.com>; Estelle Bonny (Estelle.Bonny@aecom.com) <Estelle.Bonny@aecom.com>
Subject: RE: RHMW12A Drilling Status

All,

Attached is the next installment of near real-time data for consideration by the regulatory agencies as well as external stakeholders (DLNR-CWRM) during drilling activities at Red Hill drilling location RHMW12A. Prior to continuing drilling on 4/26 (with the HQ core casing 10 feet off bottom), we conducted a baildown slug test in the morning at drilled depth 180 feet below ground surface (bgs). We deployed the Aquatroll sonde to evaluate water quality and water levels. The depth to water at RHMW12A at the time of Aquatroll deployment was 124 feet below top of casing (btoc). The top of casing is approximately 3.5 feet above land surface elevation (LSE), which is approximately 238 feet above mean sea level (msl). The resulting approximate water level elevation (WLE) (for synchronization with the transducer pressure measurements) was: (LSE+Stickup-DTW) = 238+3.5-124=~118 feet msl. Note that these estimates are roughly +/- 1 foot. As you can see from the pressure profile, the WLE remained relatively stable over the period of data collection of 31 minutes. Coring then resumed from 180 to 195 feet bgs.

At the completion of coring to 195 feet bgs on 4/26, the driller pulled the HQ core casing 12 feet off bottom prior to the data collection effort. We then again deployed the Aquatroll sonde to evaluate water quality and water levels. The depth to water at RHMW12A at the time of Aquatroll deployment was 54 feet btoc. The top of casing is approximately 5 feet above LSE, which is approximately 238 feet above msl. The resulting approximate water level elevation (WLE) (for synchronization with the transducer pressure measurements) was: (LSE+Stickup-DTW) = 238+5-54=~189 feet msl. Note that these estimates are approximate. The depth to water at RHMW12A at the completion of Aquatroll data collection this morning was 137 feet btoc (LSE+Stickup-DTW) = 238+5-137=~106 feet msl. As you can see from the overnight pressure profile, the WLE declined over time approximately 83 feet overnight (~16 hours) and roughly stabilized at approximately 106' msl. Note at the end of data collection that the transducer read 129 feet bgs (109 feet msl) and the hand readings were 132 feet bgs (106 feet msl). We found that the transducer was inadvertently placed in the borehole outside of its stated linear pressure range.

The specific conductance of the drilling make-up water was approximately 0.59 mS/cm read from the In-Situ SmartTroll water quality meter. Also, note that the values of depth of water over the transducer reported in the spreadsheet (column I) are based on assumed freshwater density and assumed conversion from SC to density. Thus they should be viewed as estimates.

We will continue to provide periodic updates as we progress forward at RHMW12A.

Thanks,
Jack

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Please consider the environment before printing this email.

From: Kronen, John
Sent: Monday, April 26, 2021 12:33 PM
To: 'Linder, Steven (Linder.Steven@epa.gov)' <Linder.Steven@epa.gov>; 'Matt Tonkin' <matt@sspa.com>; 'Tu, Lyndsey' <Tu.Lyndsey@epa.gov>; 'Grange, Gabrielle Fenix' <Gabrielle.Grange@doh.hawaii.gov>; 'Whittier, Robert' <Robert.Whittier@doh.hawaii.gov>; 'anay.shende@doh.hawaii.gov' <anay.shende@doh.hawaii.gov>; Don Thomas <dthomas@soest.hawaii.edu>; Casey, Patrick N <patrick.n.casey@hawaii.gov>; 'Chenet, Robert F' <Robert.F.Chenet@hawaii.gov>; Hardy, Roy (roy.hardy@hawaii.gov) <roy.hardy@hawaii.gov>; Imata, Ryan R (ryan.r.imata@hawaii.gov) <ryan.r.imata@hawaii.gov>; Fujimoto, Dayna K CIV USN NAVFAC HAWAII PEARL (USA) <dayna.fujimoto@navy.mil>; Lohr, Susan C CIV USN NAVSHIPYDIMF PEARL (USA) <susan.lohr@navy.mil>
Cc: Yueh Chuang (yueh.chuang@aecom.com) <yueh.chuang@aecom.com>; Skyler Pauli (skyler.pauli@aecom.com) <skyler.pauli@aecom.com>; Johnson, Jeff <JEFF.JOHNSON@aecom.com>; Roff, Douglas <Douglas.Roff@aecom.com>; Curtis C. Stanley (ccstanley@gsi-net.com) <ccstanley@gsi-net.com>; Caitlin Ellis (caitlin.ellis@aecom.com) <caitlin.ellis@aecom.com>; Elijah Callan (elijah.callan@aecom.com) <elijah.callan@aecom.com>; Ferguson, Colin <Colin.Ferguson@aecom.com>; Mintz, Bianca <Bianca.Mintz@aecom.com>; Mariano, Dominic <dominic.mariano@aecom.com>; Estelle Bonny (Estelle.Bonny@aecom.com) <Estelle.Bonny@aecom.com>
Subject: RE: RHMW12A Drilling Status

All,

Attached is the next installment of near real-time data for consideration by the regulatory agencies as well as external stakeholders (DLNR-CWRM) during drilling activities at Red Hill drilling location RHMW12A. Prior to continuing drilling on 4/23 (with the HQ core casing 10 feet off bottom), we conducted a baildown slug test in the morning at drilled depth 140 feet below ground surface (bgs). We deployed the Aquatroll sonde to evaluate water quality and water levels. The depth to water at RHMW12A at the time of Aquatroll deployment was 124 feet below top of casing (btoc). The top of casing is approximately 3.4 feet above land surface elevation (LSE), which is approximately 238 feet above mean sea level (msl). The resulting approximate water level elevation (WLE) (for synchronization with the transducer pressure measurements) was: (LSE+Stickup-DTW) = 238+3.4-124=~117 feet msl. Note that these estimates are roughly +/- 1 foot. As you can see from the pressure profile, the WLE remained relatively stable over the period of data collection of 75 minutes. Coring then resumed from 140 to 180 feet bgs.

At the completion of coring to 180 feet bgs on 4/23, the driller pulled the HQ core casing 10 feet off bottom prior to the data collection effort. We then again deployed the Aquatroll sonde to evaluate water quality and water levels. The depth to water at RHMW12A at the time of Aquatroll deployment was 74 feet btoc. The top of casing is approximately 3.4 feet above land surface elevation (LSE), which is approximately 238 feet above mean sea level (msl). The resulting approximate water level elevation (WLE) (for synchronization with the transducer pressure measurements) was: (LSE+Stickup-DTW) = 238+3.4-74=~167 feet msl. Note that these estimates are roughly +/- 1 foot. The depth to water at RHMW12A at the completion of Aquatroll data collection this morning was 124 feet btoc (LSE+Stickup-DTW) = 238+3.5-124=~117 feet msl.. As you can see from the over the weekend pressure profile, the WLE declined over time approximately 50 feet over the weekend (~63 hours). The data indicate that water in the borehole roughly stabilized at approximately 117' msl over the weekend. Note the jump at 9:43 am on 4/25 in pressure and specific conductivity (and all of the related parameters), but not in temperature. The specific conductance of the drilling make-up water was approximately 0.60 mS/cm read from the In-Situ SmartTroll water quality meter. Also, note that the values of depth of water over the transducer reported in the spreadsheet (column I) are based on assumed freshwater density and assumed conversion from SC to density. Thus they should be viewed as estimates.

Another slug test is currently being performed and we will provide those data tomorrow.

We will continue to provide periodic updates as we progress forward at RHMW12A.

Thanks,
Jack

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From: Kronen, John
Sent: Friday, April 23, 2021 11:57 AM
To: 'Linder, Steven (Linder.Steven@epa.gov)' <Linder.Steven@epa.gov>; Matt Tonkin <matt@sspa.com>; 'Tu, Lyndsey' <Tu.Lyndsey@epa.gov>; Grange, Gabrielle Fenix <Gabrielle.Grange@doh.hawaii.gov>; Whittier, Robert <Robert.Whittier@doh.hawaii.gov>; anay.shende@doh.hawaii.gov; Don Thomas <dthomas@soest.hawaii.edu>; Casey, Patrick N <patrick.n.casey@hawaii.gov>; Chenet, Robert F <Robert.F.Chenet@hawaii.gov>; Hardy, Roy (roy.hardy@hawaii.gov) <roy.hardy@hawaii.gov>; Imata, Ryan R (ryan.r.imata@hawaii.gov) <ryan.r.imata@hawaii.gov>; Fujimoto, Dayna K CIV USN NAVFAC HAWAII PEARL (USA) <dayna.fujimoto@navy.mil>; Lohr, Susan C CIV USN NAVSHIPYDIMF PEARL (USA) <susan.lohr@navy.mil>
Cc: Yueh Chuang (yueh.chuang@aecom.com) <yueh.chuang@aecom.com>; Skyler Pauli (skyler.pauli@aecom.com) <skyler.pauli@aecom.com>; Johnson, Jeff <JEFF.JOHNSON@aecom.com>; Roff, Douglas <Douglas.Roff@aecom.com>; Curtis C. Stanley (ccstanley@gsi-net.com) <ccstanley@gsi-net.com>; Caitlin Ellis (caitlin.ellis@aecom.com) <caitlin.ellis@aecom.com>; Elijah Callan (elijah.callan@aecom.com) <elijah.callan@aecom.com>; Ferguson, Colin <Colin.Ferguson@aecom.com>; Mintz, Bianca <Bianca.Mintz@aecom.com>; Mariano, Dominic <dominic.mariano@aecom.com>; Estelle Bonny (Estelle.Bonny@aecom.com) <Estelle.Bonny@aecom.com>
Subject: RE: RHMW12A Drilling Status

All,

Attached is the next installment of near real-time data for consideration by the regulatory agencies as well as external stakeholders (DLNR-CWRM) during drilling activities at Red Hill drilling location RHMW12A. Prior to continuing drilling on 4/22 (with the HQ core casing 10 feet off bottom), we conducted a baildown slug test in the morning at drilled depth 120 feet below ground surface (bgs). We deployed the Aquatroll sonde to evaluate water quality and water levels. The depth to water at RHMW12A at the time of Aquatroll deployment was 113 feet below top of casing (btoc). The top of casing is approximately 3.4 feet above land surface elevation (LSE), which is approximately 238 feet above mean sea level (msl). The resulting approximate water level elevation (WLE) (for synchronization with the transducer pressure measurements) was: (LSE+Stickup-DTW) = 238+3.4-113=~128 feet msl. Note that these estimates are roughly +/- 1 foot. As you can see from the pressure profile, the WLE remained relatively stable over the period of data collection of 75 minutes. Coring then resumed from 120 to 140 feet bgs.

At the completion of coring to 140 feet bgs on 4/22, the driller pulled the HQ core casing 0.5 feet off bottom prior to the data collection effort. We then again deployed the Aquatroll sonde to evaluate water quality and water levels. The depth to water at RHMW12A at the time of Aquatroll deployment was 79 feet btoc. The top of casing is approximately 3.5 feet above land surface elevation (LSE), which is approximately 238 feet above mean sea level (msl). The resulting approximate water level elevation (WLE) (for synchronization with the transducer pressure measurements) was: (LSE+Stickup-DTW) = 238+3.5-79=~163 feet msl. Note that these estimates are roughly +/- 1 foot. The depth to water at RHMW12A at the completion of Aquatroll data collection this morning was 96 feet btoc (LSE+Stickup-DTW) = 238+3.5-96=~146 feet msl.. As you can see from the overnight pressure profile, the WLE declined over time approximately 17

feet over approximately 14 hours. This is consistent with our assessment that this is likely drilling make-up water dissipating into the formation. The specific conductance of the drilling make-up water was approximately 0.58 mS/cm read from the In-Situ SmartTroll water quality meter. Also, note that the values of depth of water over the transducer reported in the spreadsheet (column I) are based on assumed freshwater density and assumed conversion from SC to density. Thus they should be viewed as estimates.

The driller then pulled the HQ core casing 10 feet off bottom and another slug test is currently being performed. We will provide those data on Monday.

We will continue to provide periodic updates as we progress forward at RHMW12A.

Thanks,
Jack

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Subject: RE: RHMW12A Drilling Status

All,

Please note the following:

- Driller pulled the HQ core casing 2 feet off bottom prior to the data collection effort started in Tuesday April 20.
- Driller pulled the HQ core casing 10 feet off bottom prior to the data collection effort started in Wednesday April 21.

No other information has changed.

Thanks,
Jack

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Subject: RE: RHMW12A Drilling Status

All,

Attached is the next installment of near real-time data for consideration by the regulatory agencies as well as external stakeholders (DLNR-CWRM) during drilling activities at Red Hill drilling location RHMW12A. Prior to continuing drilling on 4/21, we conducted a baildown slug test in the morning at drilled depth 100 feet below ground surface (bgs) and collected hand measurements for a period of time, see attached spreadsheet. Coring then resumed from 100 to 120 feet bgs.

At the completion of coring to 120 feet bgs on 4/21, we then deployed the Aquatroll sonde to evaluate water quality and water levels. The depth to water at RHMW12A at the time of Aquatroll deployment was 78 feet below top of casing (btoc). The top of casing is approximately 3.4 feet above land surface elevation (LSE), which is approximately 238 feet above mean sea level (msl). The resulting approximate water level elevation (WLE) (for synchronization with the transducer pressure measurements) was: (LSE+Stickup-DTW) = 238+3.4-78=~163 feet msl. Note that these estimates are roughly +/- 1 foot. As you can see from the overnight pressure profile, the WLE declined over time approximately 6 feet over 12 hours. This is consistent with our assessment that this is likely drilling make-up water dissipating into relatively low hydraulic conductivity basalt. The specific conductance of the drilling make-up water was approximately 0.64 mS/cm read from the In-Situ SmartTroll water quality meter. Also, note that the values of depth of water over the transducer reported in the spreadsheet (column I) are based on assumed freshwater density and assumed conversion from SC to density. Thus they should be viewed as estimates.

Please note, in yesterday's transducer data transmission the last 8 minutes of data (from 6:41 to 6:48) are likely impacted by simultaneous measurement of water levels with the water level probe and the Aquatroll sonde prior to termination of data collection.

We will continue to provide periodic updates as we progress forward at RHMW12A.

Thanks,
Jack

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Subject: RHMW12A Drilling Status

All,

This is the first installment of near real-time data for consideration by the regulatory agencies as well as external stakeholders (DLNR-CWRM) during drilling activities at Red Hill drilling location RHMW12A. We cored through Valley Fill materials (reworked weathered silts, clays, and cobbles) to a depth of 52 feet below ground surface (bgs). An 18" steel surface casing was installed to 57 feet bgs. As of last night, we had cored to a total depth of 100 feet bgs, and deployed the Aquatroll sonde to evaluate water quality and water levels. The depth to water at RHMW12A at the time of Aquatroll deployment was 77 feet below top of casing (btoc). The top of casing is approximately 3.4 feet above land surface elevation (LSE), which is approximately 238 feet above mean sea level (msl). The resulting approximate water level elevation (WLE) (for synchronization with the transducer pressure measurements) was: (LSE+Stickup-DTW) = 238+3.4-77=~164 feet msl. Note that these estimates are roughly +/- 1 foot. As you can see from the overnight pressure profile, the WLE declined over time approximately 2 feet over 15 hours. This is consistent with our assessment that this is likely drilling make-up water dissipating into relatively low hydraulic conductivity pahoehoe basalt. The specific conductance of the drilling make-up water is approximately 0.65 mS/cm (0.63 to 0.65 mS/cm in column E of transducer data). Also, note that the values of depth of water over the transducer reported in the spreadsheet (column I) are based

on assumed freshwater density and assumed conversion from SC to density. Thus they should be viewed as estimates. We have also attached field notes that include depth to water measurements collected by hand.

We will continue to provide periodic updates as we progress forward at RHMW12A.

Thanks,
Jack

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